

ABSTRACT OF THE DISCLOSURE

A fixed wavelength, external cavity semiconductor laser comprises a semiconductor laser gain medium and an intra-cavity filter having a filter function specifying a frequency of operation of the laser. This distinguishes it from distributed feedback Bragg reflector systems in which the wavelength of operation is dictated by the semiconductor Bragg grating, drive current, and temperature. A cavity length modulation system is further provided that modulates an optical length of the cavity to change the spectral locations of longitudinal modes of the cavity relative to the filter function. One important advantage of the present invention is that it can be deployed without a thermoelectric (TE) cooler. Specifically, the intra-cavity filter material in combination with the cavity length controller, allow a mode of cavity to be located at the filter function. Thus, the temperature of the module can fluctuate with ambient temperature or other operating parameters, but the wavelength is held stable with single longitudinal mode operation of the module being guaranteed.

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